

**MODELING SCENARIOS**

**PREPARED SPECIFICALLY FOR SIP DEVELOPMENT WORKGROUP MEETINGS – ALL STRATEGIES ARE DRAFT AND SUBJECT TO CHANGE**

<i>Basic Basket Control Measures</i>
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M1 TSI OBD/4-year exemption, then biennial  
M2 RVP reduced from 13.1 to 12.1 PSI  
M3 Voluntary and emerging mobile source bundle  
A1 Expand R307-302, Residential Fireplaces and Stoves  
A2 Expand R307-309, Fugitive Emissions and Fugitive Dust  
A3 Expand R307-335, Degreasing  
A4 Expand R307-340, Surface Coating  
A5 Expand R307-343, Wood Furniture Manufacturing  
A6 New Rule - Consumer Use Adhesive & Sealants  
A7 New Rule – Yeast Products  
A8 New Rule – Restaurants  
A9 New Rule - Autobody Refinishing  
S1 Voluntary and emerging stationary source bundle  
P1 5% reduction in projected actual point source emissions

<i>Enhanced Basket Control Measures (in addition to Basic measures above)</i>
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M4 Additional emissions reductions from mobile sources  
A10 Add Categories to Current Surface Coating Rule  
A11 New Rule – Over The Counter Consumer Use Household Products Rule  
A12 New Rule – Consumer Solvents  
A13 Phase Out Pilot lights  
A14 Commercial/Institutional - Natural Gas Low NOx Burners  
P2 Additional 20% reduction in projected actual point source emissions

## **Control Strategies – Mobile Source**

### **M1 TSI OBD/4-year exemption, then biennial**

Assumes the implementation of a vehicle inspection and maintenance program in Box Elder, Cache, and Tooele counties, including two-speed idle (TSI) and on-board diagnostics II (OBD II) testing. New vehicles would be exempt from testing for the first three years, followed by biennial testing.

### **M2 RVP reduced from 13.1 to 12.1 PSI**

Assumes a one pound per square inch (PSI) reduction in the Reid vapor pressure (RVP) of gasoline, thereby making the fuel less volatile and helping to reduce VOC emissions.

### **M3 Voluntary and emerging mobile source bundle**

This item represents a bundle of various voluntary and emerging mobile source control measures. Examples of such measures include, but are not limited to:

- trip reduction programs
- alternative fuels
- diesel retrofits
- episode-triggered/inversion-specific measures

This bundle is limited by EPA guidance to 3 percent of the total reduction required to achieve attainment in a planning year. For the purposes of this exercise, DAQ assumed the maximum credit allowed by EPA guidance for this bundle. The actual composition of this bundle (i.e. the measures ultimately included), responsibility for implementation, funding sources, statutory or rule-making requirements, and other details have not yet been specified and would need to be developed in consultation with relevant agencies, authorities, and stakeholders.

### **M4 Additional emissions reductions from mobile sources**

Assumes an additional 2.7 percent reduction in VOC emissions and an additional 7.1 percent reduction in direct PM 2.5 emissions by 2019 in the Provo-Orem and Salt Lake-Ogden-Clearfield nonattainment areas. The strategies required to achieve this level of reduction have not yet been identified and would be developed through consultation with the municipal planning organizations (MPOs) that represent the affected areas.

## **Control Strategies – Area Source**

### **A1 Expand R307-302, Residential Fireplaces and Stoves**

- Expand current rule to PM2.5 nonattainment counties.
- Red day burning restriction cut point reduced from 35 to 25 ug/m<sup>3</sup>. Adds 10-20 additional red days, depending on county.
- Ban outdoor wood boilers that contribute direct PM2.5. Stack temperatures in these units are too low to disperse emissions.
- Require future sale of EPA certified stoves

Reduction:

- 99.5% VOC, PM2.5, NOx and SOx
- 90% VOC, PM2.5, NOx and SOx

### **A2 Expand R307-309, Fugitive Emissions and Fugitive Dust**

Rule presently regulates fugitive dust control requirements in Salt Lake and Utah Counties and the City of Ogden. Applies to all building and road construction, mining and sand & gravel processes. Rule requires filing of dust control plan when soil disturbance for area greater than ¼ acre.

Reduction:

- 56% PM2.5 for road construction
- 30% PM2.5 for building
- 32% PM2.5 for sand & gravel processes

### **A3 Expand R307-335, Degreasing to Apply Beyond Ozone Nonattainment Area**

- Degreasing operations/surface cleaning controls. VOC emissions reduction by the use of low-VOC content solvents and by changes in operating practices.
- Expand current rule to PM2.5 nonattainment counties.
- Add industrial solvent cleaning component to rule that deals with non-tank type of degreasing.

Reduction:

- 25% VOC for degreasing in tanks
- 75% VOC for industrial solvent cleaning

### **A4 Expand R307-340, Surface Coating to Apply Beyond Ozone Nonattainment Area**

Surface coating operations on varied media. Control VOC emission. Rule presently regulates in Salt Lake and Davis Counties. Expand current rule to PM2.5 nonattainment counties.

Low solvent substitution or engineering control.

<i>Category</i>	<i>VOC Reduction (county specific)</i>
Appliance	48-54%
Paper, Film and Foil	72-81%
Metal Furniture	48-54%
Magnet Wire	29%
Flat Wood	48-54%
Graphic Arts	52-59%

#### *Miscellaneous Metal Parts*

<i>Category</i>	<i>VOC Reduction (county specific)</i>
Metal Containers	28-32%
Machinery	35%
High Performance	16%

Special	28%
Fabric and Other	48%

-Add sheet, strip and coil category to rule 29% VOC reduction

**A5 Expand R307-343, Wood Furniture Manufacturing to Apply Beyond Ozone Nonattainment**

Use of solvents in manufacturing process. Low solvent substitution or engineering control.

Reduction: 38% VOC.

**A6 New Rule - Consumer Use Adhesive & Sealants**

Require use of waterborne, hot melt and other types of adhesives in consumer products.

Reduction: 58% VOC.

**A7 New Rule – Yeast Products**

Regulate yeast leavening products in large to medium sized bakeries

Reduction: 72% VOC

**A8 New Rule – Restaurants**

Meat cooked on charbroilers release PM2.5 and VOC. Place controls on all chain-driven charbroilers and controls are larger kitchens cooking on underfire charbroilers, grills, fryers etc.

Reduction: 56% PM2.5 and VOC

**A9 New Rule - Autobody Refinishing**

Paint stripping and miscellaneous surface coating operations.

Reduction: 30% VOC

**A10 Add Categories to Current Surface Coating Rule**

Not presently included in surface coating rule. Proposal to amend rule to include:

Category	VOC Reduction (%)
Aircraft	49
Marine	49
Other Transportation	30
Traffic Markings (road paints)	27

**A11 New Rule – Over The Counter Consumer Use Household Products Rule**

Regulate VOC content limits. Examples include aerosol adhesives, floor wax strippers, dry cleaning fluids, and general purpose cleaners.

Reduction: 31% VOC

**A12 New Rule – Consumer Solvents**

Regulate VOC content for personal care products, household cleaners and disinfectants, automotive aftermarket products, adhesives and sealants, lawn and garden products, and household insecticides.

Reduction: 68% VOC

**A13 Phase Out Pilot lights**

Phase out pilot lights for water heaters, gas fireplaces and stoves in residential, commercial and institutional use.

Reduction: VOC, SO<sub>x</sub>, NO<sub>x</sub>, PM<sub>2.5</sub>, Ammonia Reduction, 48% reduction phased in over 10 years

**A14 Commercial/Institutional - Natural Gas**

Low NO<sub>x</sub> burners.

Reduction: 28% phased in 10 years.

**Control Strategies – Voluntary Stationary**

**S1 Voluntary and emerging stationary source bundle**

This item represents a bundle of various voluntary and emerging stationary source control measures. Examples of such measures include, but are not limited to:

- retail entity sales agreements regarding high-VOC emitting products
- consumer programs aimed at reducing the use of high-emitting paints
- deferring or reducing consumer/industry maintenance
- observing best operating practices

This bundle is limited by EPA guidance to 6 percent of the total reduction required to achieve attainment in a planning year. For the purposes of this exercise, DAQ assumed the maximum credit allowed by EPA guidance for this bundle. The actual composition of this bundle (i.e. the measures ultimately included), responsibility for implementation, funding sources, statutory or rule-making requirements, and other details have not yet been specified and would need to be developed in consultation with relevant agencies, authorities, and stakeholders.

**Control Strategies – Point Source**

**P1 5% reduction in projected actual point source emissions**

- Emission reductions from industrial point sources, achieved through Reasonably Available Control Technology (RACT)
- 35 “large” point sources within the 3 nonattainment areas
- A “large” point source had emissions of 100 tons of PM<sub>2.5</sub> (or one of its precursors) in 2008 OR is permitted such that it could emit 100 tons in any given year

- Each of these sources is presently under review by DAQ to see that RACT is applied

Part of this process is quantifying the emission reduction concepts for each of the projection years, and this work is still on-going. Therefore, current modeling predictions still contain only an estimate for what these reductions will ultimately be. The estimate reflected in these modeling results is a **5%** reduction in the projected actual emissions of PM<sub>2.5</sub>, SO<sub>2</sub> and VOC from these large point sources.

DAQ recognizes that NO<sub>x</sub> is also a precursor to PM<sub>2.5</sub>, and that RACT will also apply to NO<sub>x</sub>, but the model is more sensitive to these other pollutants so the estimate was simplified for now.

It is also important to keep in mind that many of the area source controls identified above (e.g. Degreasing, Surface Coating, and Wood Finishing) will actually apply to point sources that were not large enough to warrant individual attention.

## **P2 Additional 20% reduction in projected actual point source emissions**

- Emission reductions from industrial point sources, achieved through Reasonably Available Control Technology (RACT)
- 35 “large” point sources within the 3 nonattainment areas
- A “large” point source had emissions of 100 tons of PM<sub>2.5</sub> (or one of its precursors) in 2008, OR is permitted such that it could emit 100 tons in any given year
- Each of these sources is presently under review by DAQ to see that RACT is applied

The work necessary to quantify the various emission reduction concepts at these sources is still on-going. Therefore, current modeling predictions still contain only an estimate for what these reductions will ultimately be. This control strategy assumes an **additional 20% reduction** in projected actual point source emissions (for a total of 25%). The estimate for RACT control of large point sources in the “basic basket” had been 5%. As before, the reduction was applied to PM<sub>2.5</sub>, SO<sub>2</sub> and VOC emissions.

**APPENDIX A: Summary of Control Strategies by Nonattainment Area****Table 1 – Logan Emissions Reduction by Control Strategy (% of Total Inventory)**

Strategy	2014				2019			
	NOX	VOC	SOX	PM2.5	NOX	VOC	SOX	PM2.5
M1 TSI OBD/4-year exemption, then biennial	3.1	2.1	-	-	2.8	1.6	-	-
M2 RVP reduced from 13.1 to 12.1 PSI	0.4	0.5	-	-	0.3	0.3	-	-
M3 Voluntary and emerging mobile source bundle	0.2	0.3	0.2	0.3	0.2	0.3	0.3	0.2
M4* Additional emissions reductions from mobile sources	-	-	-	-	-	-	-	-
A1 Expand R307-302, Residential Fireplaces and Stoves	-	0.3	0.1	2.1	-	0.4	0.1	3.2
A2 Expand R307-309, Fugitive Emissions and Fugitive Dust	-	-	-	4.8	-	-	-	5.2
A3 Expand R307-335, Degreasing	-	0.2	-	-	-	0.2	-	-
A4 Expand R307-340, Surface Coating	-	7.9	-	-	-	9.2	-	-
A5 Expand R307-343, Wood Furniture Manufacturing	-	0.5	-	-	-	0.6	-	-
A6 New Rule - Consumer Use Adhesive & Sealants	-	0.4	-	-	-	0.5	-	-
A7 New Rule – Yeast Products	-	0.2	-	-	-	0.2	-	-
A8 New Rule – Restaurants	-	0.1	-	7.7	-	0.1	-	10.5
A9 New Rule - Autobody Refinishing	-	0.7	-	-	-	0.9	-	-
A10* Add Categories to Current Surface Coating Rule	-	0.5	-	-	-	0.6	-	-
A11* New Rule – Over The Counter Consumer Use Household Products Rule	-	2.3	-	-	-	2.8	-	-
A12* New Rule – Consumer Solvents	-	2.0	-	-	-	2.4	-	-
A13* Phase Out Pilot lights	6.1	0.3	0.6	0.3	7.8	0.3	0.6	0.3
A14* Commercial/Institutional - Natural Gas Low NOx Burners	9.8	0.4	-	6.7	4.3	0.1	-	2.6
S1 Voluntary and emerging stationary source bundle	0.1	0.3	0.4	0.2	0.1	0.4	0.4	0.2
P1 5% reduction in projected actual point source emissions	-	0.3	-	-	-	0.3	-	-
P2* Additional 20% reduction in projected actual point source emissions	-	1.1	-	-	-	1.2	-	-

\*Enhanced Basket control strategy

**Table 2 – Provo-Orem Emissions Reduction by Control Strategy (% of Total Inventory)**

Strategy	2014				2019			
	NOX	VOC	SOX	PM2.5	NOX	VOC	SOX	PM2.5
M1 TSI OBD/4-year exemption, then biennial	-	-	-	-	-	-	-	-
M2 RVP reduced from 13.1 to 12.1 PSI	0.4	0.5	-	-	0.3	0.3	-	-
M3 Voluntary and emerging mobile source bundle	0.2	0.4	0.4	0.2	0.3	0.3	0.5	0.2
M4* Additional emissions reductions from mobile sources	5.8	1.2	2.9	3.9	6.0	1.0	3.6	3.9
A1 Expand R307-302, Residential Fireplaces and Stoves	-	-	-	0.1	-	-	-	0.1
A2 Expand R307-309, Fugitive Emissions and Fugitive Dust	-	-	-	-	-	-	-	-
A3 Expand R307-335, Degreasing	-	0.1	-	-	-	0.1	-	-
A4 Expand R307-340, Surface Coating	-	4.3	-	-	-	5.0	-	-
A5 Expand R307-343, Wood Furniture Manufacturing	-	0.7	-	-	-	0.9	-	-
A6 New Rule - Consumer Use Adhesive & Sealants	-	0.7	-	-	-	0.9	-	-
A7 New Rule – Yeast Products	-	0.3	-	-	-	0.4	-	-
A8 New Rule – Restaurants	-	0.1	-	10.1	-	0.2	-	12.7
A9 New Rule - Autobody Refinishing	-	0.9	-	-	-	1.1	-	-
A10* Add Categories to Current Surface Coating Rule	-	1.2	-	-	-	1.5	-	-
A11* New Rule – Over The Counter Consumer Use Household Products Rule	-	3.8	-	-	-	4.5	-	-
A12* New Rule – Consumer Solvents	-	3.3	-	-	-	3.9	-	-
A13* Phase Out Pilot lights	5.8	0.4	0.6	0.3	6.9	0.3	0.6	0.3
A14* Commercial/Institutional - Natural Gas Low NOx Burners	10.2	0.6	-	8.0	-	0.1	-	-
S1 Voluntary and emerging stationary source bundle	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
P1 5% reduction in projected actual point source emissions	-	0.2	0.3	0.4	-	0.2	0.4	0.4
P2* Additional 20% reduction in projected actual point source emissions	-	0.6	1.3	1.4	-	0.6	1.5	1.7

\*Enhanced Basket control strategy



**Table 3 – Salt Lake-Ogden-Clearfield Emissions Reduction by Control Strategy (% of Total Inventory)**

Strategy	2014				2019			
	NOX	VOC	SOX	PM2.5	NOX	VOC	SOX	PM2.5
M1 TSI OBD/4-year exemption, then biennial	0.5	0.3	-	-	0.4	0.2	-	-
M2 RVP reduced from 13.1 to 12.1 PSI	0.3	0.5	-	-	0.2	0.3	-	-
M3 Voluntary and emerging mobile source bundle	0.2	0.3	0.1	0.2	0.2	0.3	0.1	0.2
M4* Additional emissions reductions from mobile sources	4.4	1.1	0.3	3.2	3.9	0.9	0.3	2.8
A1 Expand R307-302, Residential Fireplaces and Stoves	-	-	-	0.2	-	0.1	-	0.3
A2 Expand R307-309, Fugitive Emissions and Fugitive Dust	-	-	-	1.3	-	-	-	1.5
A3 Expand R307-335, Degreasing	-	0.2	-	-	-	0.2	-	-
A4 Expand R307-340, Surface Coating	-	1.7	-	-	-	1.9	-	-
A5 Expand R307-343, Wood Furniture Manufacturing	-	0.3	-	-	-	0.3	-	-
A6 New Rule - Consumer Use Adhesive & Sealants	-	0.5	-	-	-	0.6	-	-
A7 New Rule – Yeast Products	-	0.2	-	-	-	0.3	-	-
A8 New Rule – Restaurants	-	0.1	-	6.1	-	0.1	-	7.7
A9 New Rule - Autobody Refinishing	-	1.1	-	-	-	1.3	-	-
A10* Add Categories to Current Surface Coating Rule	-	2.9	-	-	-	3.4	-	-
A11* New Rule – Over The Counter Consumer Use Household Products Rule	-	2.8	-	-	-	3.3	-	-
A12* New Rule – Consumer Solvents	-	2.4	-	-	-	2.8	-	-
A13* Phase Out Pilot lights	5.3	0.4	0.3	0.2	5.4	0.3	0.2	0.2
A14* Commercial/Institutional - Natural Gas Low NOx Burners	5.2	0.3	-	4.0	0.5	-	-	0.3
S1 Voluntary and emerging stationary source bundle	0.5	0.6	1.1	0.6	0.5	0.7	1.1	0.7
P1 5% reduction in projected actual point source emissions	-	0.4	4.4	1.3	-	0.4	4.4	1.5
P2* Additional 20% reduction in projected actual point source emissions	-	1.6	17.4	5.2	-	1.7	17.4	5.9

\*Enhanced Basket control strategy

## **APPENDIX B: Interactive Data Explorer Information**

The Interactive Data Explorer may be found at the following web address:

<http://www.airquality.utah.gov/Public-Interest/Current-Issues/pm2.5/presentations/index.html>

For more information on this resource, please contact Chris Pennell (DAQ) at 801-536-4098 or [cpennell@utah.gov](mailto:cpennell@utah.gov).